

## REMARKS

Claims 1-9 and 63-70 are pending in this application. Claims 1, 6, 7 and 63 are amended herein to replace the term "radiofrequency" with "radio frequency" as suggested by the Examiner in the Office action dated January 11, 2006. This replacement is supported in the specification at least in paragraphs [0074] and [0286]. Claim 4 is amended herein to correct two minor typographical errors, and claim 63 is amended to replace "electrode" with "plasma excitation electrode" in two instances. Independent claims 1 and 63 are amended herein to include a limitation directed to the the first series resonant frequency  $f_0$ , as supported in the specification at least in Figures 3 and 8 and in paragraphs [0226]-[0241]. Claims 64-70 are new and are supported in the specification at least in paragraphs [0076], [0220], [0237]-[0241], [0249], [0458]-[0459], and [0464]. No new matter has been added.

### Claim Objections

The Examiner objected to claims 1-9 because of the inclusion of the term "radiofrequency" in the claims. Per the Examiner's suggestion, Applicants have replaced the term "radiofrequency" with "radio frequency." Support for this replacement may be found in the specification at least in paragraphs [0074] and [0286].

In light of this amendment to the claims, Applicants respectfully request that the Examiner withdraw this objection.

### Claim Rejections Under 35 U.S.C. § 112

The Examiner asserted that claim 9 is indefinite under 35 U.S.C. §112, second paragraph. This rejection was made also in previous Office actions. On page 8 of the Office action dated June 7, 2005, the Examiner stated: "Claim 9 does not 'particularly point out and distinctly claim the subject matter which applicant regards as the invention' simply by referring to 'characteristics' of a process parameter such as

'resonant frequency'...Applicant is suggested to amend claim 9 to recite 'the characteristic of resonant frequency...' or similar wording."

Applicants respectfully point out that the previous response included this suggested amendment to claim 9. Applicants therefore respectfully request that the Examiner withdraw this rejection under 35 U.S.C. §112 to claim 9.

The Examiner further asserted that claim 63 is indefinite under 35 U.S.C. §112, second paragraph. Applicants have amended claim 63 to overcome this rejection, and therefore respectfully request that the Examiner withdraw the rejection of claim 63 under 35 U.S.C. §112.

### **Claim Rejections Under 35 U.S.C. § 103**

The Examiner asserted that claims 1-6, 8, and 9 are unpatentable under 35 U.S.C. § 103(a) over Murata et al. (U.S. Patent 5,423,915, "Murata") in view of Patrick (U.S. Patent 5,474,648). Applicants respectfully disagree.

The Examiner stated that "Applicant's claim limitation of 'wherein the first series resonant frequency  $f_0$  corresponds to a minimum impedance of the plasma processing chamber, the minimum impedance evaluated with the plasma chamber disconnected from the plasma apparatus during a non-discharge period' appears to be a claim recitation of intended use in the pending apparatus claims." Applicants disagree that this claim limitation sets forth a method of use of the apparatus. In fact, the claim limitation correlates the first series resonant frequency  $f_0$  to the minimum impedance of the plasma processing chamber and thus to the structure of the chamber. To further clarify, however, the correlation between the first series resonant frequency  $f_0$  and the structure of the plasma processing apparatus, claim 1 is amended herein.

Amended claim 1 requires that the first series resonant frequency  $f_0$  of the plasma processing chamber is determined from electrical radio frequency factors of the plasma processing chamber and respective constituent elements disposed near the

plasma processing chamber. This amendment finds support at least in Figures 3 and 8 and in paragraphs [0226]-[0241].

Neither Murata nor Patrick teaches or suggests a first series resonant frequency  $f_0$  of the plasma processing chamber, much less a first series resonant frequency determined from electrical radio frequency factors of and respective constituent elements disposed near the plasma processing chamber. Since the cited references, either alone or in combination, do not teach or suggest each and every element of the claims, a *prima facie* case of obviousness has not been established. Applicants therefore respectfully request that the Examiner withdraw the claim rejections under 35 U.S.C. § 103(a).

The Examiner also asserted that claim 7 is unpatentable under 35 U.S.C. § 103(a) over Murata et al. (U.S. Patent 5,423,915, "Murata") and Patrick (U.S. Patent 5,474,648) in view of Stramke (U.S. Patent 4,645,981).

Applicants respectfully disagree in light of the amendment herein to independent claim 1, from which claim 7 depends. For the reasons discussed above, a *prima facie* case of obviousness has not been established, and Applicants therefore respectfully request that the Examiner withdraw the rejection of claim 7 under 35 U.S.C. § 103(a).

The Examiner further asserted that claims 10 and 63 are unpatentable under 35 U.S.C. § 103(a) over Murata et al. (U.S. Patent 5,423,915, "Murata") in view of Patrick (U.S. Patent 5,474,648) and Hoke (U.S. Patent 5,077,875).

Applicants respectfully disagree in light of the amendments herein to independent claim 63 and independent claim 1, from which claim 10 depends. Either alone or in combination, Murata, Patrick, and Hoke fail to teach or suggest each and every element of independent claim 1 and claim 63, per the preceding arguments. Therefore a *prima facie* case of obviousness has not been established. Applicants

therefore respectfully request that the Examiner withdraw the rejection of claims 10 and 63 under 35 U.S.C. § 103(a).

### **Patentability of New Claims 64-70**

New claim 64 and new claim 65 depend from claim 1, which has been amended as described above to overcome the rejection of the Examiner under 35 U.S.C. § 103(a). Applicants submit, therefore, that new claims 64 and 65 are patentable and respectfully request that the Examiner allow these claims.

New independent claim 66 requires a plasma processing chamber having a first series resonant frequency  $f_0$ . The claim further requires one or more structural factors which are adjusted so that three times the first series resonant frequency  $f_0$  is larger than a power frequency  $f_e$  supplied from the radio frequency generator. New claim 67 depends from claim 66 and requires one or more structural factors adjusted so that 1.3 times the first series resonant frequency  $f_0$  is larger than a power frequency  $f_e$ . New claim 68 also depends from claim 66 and requires one or more structural factors adjusted so that the first series resonant frequency  $f_0$  is larger than a power frequency  $f_e$ . New claims 69 and 70 also depend from claim 66 and respectively require that the one or more structural factors include an overlapping area of the plasma electrode with respect to the chamber wall (claim 69), and that the one or more structural factors include a length of the radio frequency feeder (claim 70).

None of the references cited by the Examiner teaches or suggests a first series resonant frequency  $f_0$  of the plasma processing chamber, much less one or more structural factors adjusted so that three times the first series resonant frequency  $f_0$  is larger than the power frequency  $f_e$ . Indeed, none of the references shows any recognition that by adjusting one or more structural factors of the plasma processing apparatus (such as an overlapping area of the plasma electrode with respect to the chamber wall, or a length of the radio frequency feeder) the first series resonant frequency  $f_0$  may be set as described, thereby enabling optimization of the overall radio frequency electrical characteristics and improving the stability of plasma generation.

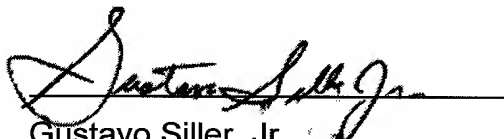
Applicants submit, therefore, that claims 66-70 are patentable and respectfully request that the Examiner allow these claims.

### Summary

For at least the reasons given above, the Applicants respectfully submit that claims 1-9 and 63-70 are allowable and request that a Notice of Allowance issue.

The Examiner is respectfully requested to contact the undersigned in the event that a telephone interview would expedite consideration of the application.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Gustavo Siller, Jr.", written over a horizontal line.

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